Amendments to the claims:

1. (Currently amended) A polymer concrete composition comprising:

a cured polyurethane resin formed as a reaction product formed from a reaction mixture including at least one vegetable oil-based polyol, ~~and~~ at least one isocyanate having at least two isocyanate moieties per molecule, and an effective amount of crosslinker for increasing compressive strength, flexural modulus, tensile strength, and hardness of the composition, and;

an aggregate composition bonded to the cured polyurethane resin,

the aggregate composition being present in an amount ranging from 70% to 90% by weight of the polymer concrete composition.

2. (Original) The polymer concrete composition of claim 1, wherein the vegetable oil-based polyol has on average at least three hydroxyl groups per polyol molecule.

3. (Original) The polymer concrete composition of claim 2, wherein the vegetable oil-based polyol has on average at least four hydroxyl groups per polyol molecule.

4. (Original) The polymer concrete composition of claim 2, wherein the vegetable oil-based polyol is essentially unsaturated.

5. (Original) The polymer concrete composition of claim 1, wherein the vegetable oil-based polyol comprises an unsaturated derivative of a vegetable oil selected

from the group consisting of safflower oil, linseed oil, corn oil, sunflower oil, canola oil, cottonseed oil, rapeseed oil, tung oil, peanut oil, and mixtures thereof.

6. (Original) The polymer concrete composition of claim 1, wherein the vegetable oil-based polyol comprises a soybean oil derivative.

7. (Original) The polymer concrete composition of claim 6, wherein the vegetable oil-based polyol has on average at least four hydroxyl groups per polyol molecule.

8. (Original) The polymer concrete composition of claim 6, wherein the vegetable oil-based polyol has a hydroxyl number ranging from 180 to 260, an epoxy number ranging from 0.02% to 0.03%, and a viscosity less than 15 pascal-seconds.

9. (Original) The polymer concrete composition of claim 6, wherein the vegetable oil-based polyol has a hydroxyl number ranging from 205 to 210.

10. (Original) The polymer concrete composition of claim 6, wherein the vegetable oil-based polyol has a viscosity less than 15 pascal-seconds.

11. (Original) The polymer concrete composition of claim 1, wherein the vegetable oil-based polyol has on average at least 3.9 hydroxyl groups per polyol molecule.

12. (Original) The polymer concrete composition of claim 11, wherein the vegetable oil-based polyol has a hydroxyl number ranging from 180 to 260, an epoxy number ranging from 0.02% to 0.03%, and a viscosity less than 15 pascal-seconds.

13. (Original) The polymer concrete composition of claim 11, wherein the vegetable oil-based polyol has a hydroxyl number ranging from 205 to 210.

14. (Original) The polymer concrete composition of claim 11, wherein the vegetable oil-based polyol has a viscosity less than 15 pascal-seconds.

15. (Original) The polymer concrete composition of claim 1, wherein the isocyanate comprises a diisocyanate.

16. (Original) The polymer concrete composition of claim 1, wherein the isocyanate in the reaction mixture comprises a stoichiometric excess amount of the isocyanate moieties in comparison to hydroxyl moieties in the vegetable oil-based polyol.

17. (Original) The polymer concrete composition of claim 18, wherein a ratio of isocyanate moieties in the isocyanate to hydroxyl moieties in the vegetable oil-based polyol ranges from 1.02 to 1.15.

18. (Original) The polymer concrete composition of claim 17, wherein the ratio ranges from 1.05 to 1.10.

19. (Original) The polymer concrete composition of claim 18 wherein the ratio is essentially 1.05.

20. (Original) The polymer concrete composition of claim 1, wherein the aggregate composition is selected from the group consisting of silica, fly ash, lime, sand, pea gravel, crushed rock, and mixtures thereof.

21. (Original) The polymer concrete composition of claim 1, wherein the aggregate composition is selected from the group consisting of (a) sand and (b) fly ash, silica, lime and mixtures thereof.

22. (Original) The polymer concrete composition of claim 21, wherein the group additionally consists of metal fines, glass fibers, synthetic fibers, glass reinforcing mats, glass strands, glass filaments, metal fibers, mineral powders, and mixtures thereof.

23. (Original) The polymer concrete composition of claim 21, wherein the aggregate composition contains from 10% to about 15% by weight of (b).

24. (Original) The polymer concrete composition of claim 1, wherein the aggregate composition comprises 25% or less of pea gravel by weight of the aggregate composition.

25. (Original) The polymer concrete composition of claim 1, wherein the aggregate composition comprises 25% or more of pea gravel by weight of the aggregate composition.

26. (Original) The polymer concrete composition of claim 1, wherein the aggregate composition comprises 50% or more of pea gravel by weight of the aggregate composition.

27. (Original) The polymer concrete composition of claim 1, wherein the aggregate composition comprises 75% or more of pea gravel by weight of the aggregate composition.

28. (Canceled) .

29. (Currently Amended) The polymer concrete composition of claim 1 ~~28~~, wherein the crosslinker comprises glycerin in an amount ranging from 5 parts per hundred to 30 parts per hundred by weight of the vegetable oil-based polyol.

30. (Currently Amended) The polymer concrete composition of claim 1 ~~28~~, wherein the crosslinker comprises glycerin in an amount ranging from 15 parts per hundred to 25 parts per hundred by weight of the vegetable oil-based polyol.

31. (Currently Amended) The polymer concrete composition of claim 1 ~~28~~, wherein the crosslinker comprises glycerin in an amount ranging from 1 part per hundred to 10 parts per hundred by weight of the vegetable oil-based polyol.

32. (Original) The polymer concrete composition of claim 1, wherein the reaction mixture comprises a catalyst in an amount effective for adjusting pot life of the reaction mixture to a predetermined value ranging between 10 minutes and 80 minutes at room temperature.

33. (Original) The polymer concrete composition of claim 1, wherein the reaction mixture comprises a catalyst in an amount effective for adjusting gel time of the reaction mixture to a predetermined value ranging between 10 minutes and 70 minutes at room temperature.

34. (Original) The polymer concrete composition of claim 1, comprising an organometallic catalyst present in an amount up to about 0.4 % of the reaction mixture by weight.

35. (Previously presented) The polymer concrete composition of claim 1, wherein the amount of cured polyurethane resin ranges between 10% and 20% of the polymer concrete composition by weight.

36. (Original) The polymer concrete composition of claim 35, wherein the amount of cured polyurethane resin ranges between 10% and 15% of the polymer concrete composition by weight.

37. (Original) The polymer concrete composition of claim 1, wherein the amount of cured polyurethane resin is essentially 15% of the polymer concrete composition by weight.

38. (Previously presented) The polymer concrete composition of claim 1, wherein the amount of cured polyurethane resin ranges from 15% to 20% of the polymer concrete composition by weight.

39. (Original) A composition for preparing a polymeric concrete comprising:

(a) 80% to 90 % by weight of said composition of an aggregate composition;

(b) 10% to 20% by weight of a polyurethane matrix prepared by contacting (i) a vegetable oil-based polyol having on average at least three hydroxyl groups per molecule, (ii) an isocyanate having on average at least two isocyanate groups per molecule, and (iii) 0 pph to 10 pph of a crosslinker based upon weight of the vegetable oil-based polyol; and

(c) 0% to 0.4 % of a catalyst by weight of the vegetable oil-based polyol.

40. (Original) The composition of claim 39, the crosslinker being a triol present in an amount ranging between 5 pph and 10 pph by weight of the vegetable oil-based polyol.

41. (Original) The composition of claim 40, the triol comprising glycerine.

42. (Original) The composition of claim 39, the catalyst being present in an amount ranging between 0.1% and 0.4 % by weight by weight of the vegetable oil-based polyol.

43. (Original) The composition of claim 39 wherein the vegetable oil-based polyol comprises soy-based polyol.

44. (Original) The composition of claim 39, wherein the aggregate composition is selected from the group consisting of (a) sand and (b) fly ash, silica, lime and mixtures thereof.

45. (Original) The composition of claim 44, wherein the group additionally consists of metal fines, glass fibers, synthetic fibers, glass reinforcing mats, glass strands, glass filaments, metal fibers, mineral powders, and mixtures thereof.

46. (Previously presented) The composition of Claim 44, wherein the aggregate composition contains from 10% to 15% by weight of (b).

47. (Previously presented) The composition of Claim 39, wherein the aggregate composition comprises 25% or less of pea gravel by weight of the aggregate composition.

48. (Previously presented) The composition of Claim 39, wherein the aggregate composition comprises 25% or more of pea gravel by weight of the aggregate composition.

49. (Previously presented) The composition of Claim 39, wherein the aggregate composition comprises 50% or more of pea gravel by weight of the aggregate composition.

50. (Previously presented) The composition of Claim 39, wherein the aggregate composition comprises 75% or more of pea gravel by weight of the aggregate composition.

51. (Currently amended) A composition for preparing a polymeric concrete comprising:

80% to 90 % by weight of the composition of an aggregate composition comprising a mixture of (a) sand and (b) fly ash, silica, lime or mixtures thereof, wherein said aggregate composition contains from 10% to 15% by weight of (b);

<u>from</u> 10% to 20% by weight of a polyurethane matrix prepared by contacting (i) a soy-polyol, (ii) an isocyanate having at least two -NCO groups per molecule, and (iii) from 5 pph to 10 pph by weight of the soy polyol of glycerin, wherein the ratio of equivalents of -NCO to equivalents of -OH is about 1.05 to about 1.10; and

about 0.1% to about 0.4 % by weight of the soy polyol of a catalyst<u>, and</u>

<u>an effective amount of crosslinker for increasing compressive strength, flexural modulus, tensile strength, and hardness of the composition</u>.

52. (Currently amended) A method for preparing a polyurethane polymer concrete from a vegetable oil-based polyol comprising:

(a) admixing:

(1) the vegetable oil-based polyol,

(2) an aggregate composition, and

(3) an isocyanate having at least two -NCO moieties per isocyanate molecule in a reaction vessel under conditions to form an admixture that contains from 70% to 90% by weight of the aggregate composition

(4) an effective amount of crosslinker for increasing compressive strength, flexural modulus, tensile strength, and hardness of the composition; and

(b) curing the admixture.

53. (Original) The method of claim 52 further comprising, after said admixing in step (a),

removing air bubbles from the admixture by applying a vacuum to the reaction vessel.

54. (Original) The method of claim 52 further comprising holding the admixture for a period of time prior to the curing step.

55. (Original) The method of claim 52, wherein the curing step includes curing the admixture under ambient conditions.

56. (Original) The method of claim 52, wherein the curing step includes curing the admixture under an elevated temperature with respect to ambient conditions.

57. (Original) The method of claim 52, wherein the vegetable oil-based polyol used in the admixing step has on average at least three hydroxyl groups per polyol molecule.

58. (Original) The method of claim 57 wherein the vegetable oil-based polyol used in the admixing step is a hydroxylated derivative of a vegetable oil selected from the group consisting of soybean oil, safflower oil, linseed oil, corn oil, sunflower oil, canola oil, cottonseed oil, rapeseed oil, tung oil, peanut oil, fish oil or mixtures thereof.

59. (Original) The method of claim 52, wherein the vegetable oil-based polyol used in the admixing step has on average at least four hydroxyl groups per polyol molecule.

60. (Original) The method of claim 52, wherein the vegetable oil-based polyol used in the admixing step is a soy-based polyol.

61. (Original) The method of claim 60, wherein the soy-polyol has a hydroxyl number of about 180 to 260, an epoxy number of 0.02% to 0.03%, and a viscosity less than 15 pascal-seconds.

62. (Original) The method of claim 61, wherein said soy-polyol has a hydroxyl number of 205 to 210.

63. (Original) The method of claim 52, wherein the isocyanate used in the step of admixing is a diisocyanate.

64. (Original) The method of claim 52, wherein admixing step includes the admixture having a ratio of equivalents of isocyanate moieties in the isocyanate to equivalents of hydroxyl moieties in the vegetable oil-based polyol ranging from 1.02 to about 1.15.

65. (Original) The method of claim 64, wherein the ratio is from 1.05 to 1.10.

66. (Original) The method of claim 65, wherein ratio is about 1.05.

67. (Original) The method of claim 52, wherein the aggregate composition used in the admixing step is selected from the group consisting of comprises silica, fly ash, lime, sand, pea gravel, crushed stone or rock, and mixtures.

68. (Original) The method of claim 52, wherein the aggregate composition used in the step of admixing comprises 25% or less of pea gravel by weight of the aggregate composition.

69. (Original) The method of claim 52, wherein the aggregate composition used in the step of admixing comprises 25% or more of pea gravel by weight of the aggregate composition.

70. (Original) The method of claim 52, wherein the aggregate composition used in the step of admixing comprises 50% or more of pea gravel by weight of the aggregate composition.

71. (Original) The method of claim 52 wherein the step of admixing includes admixing a crosslinker.

72. (Original) The method of claim 71, wherein the crosslinker comprises glycerin in an amount ranging from 5 parts per hundred to 30 parts per hundred by weight of the vegetable oil-based polyol.

73. (Original) The method of claim 71, wherein the crosslinker comprises glycerin in an amount ranging from 15 parts per hundred to 25 parts per hundred by weight of the vegetable oil-based polyol.

74. (Original) The method of claim 71, wherein the crosslinker comprises glycerin in an amount ranging from 1 part per hundred to 10 parts per hundred by weight of the vegetable oil-based polyol.

75. (Original) The method of claim 52, wherein the admixing step includes admixing a catalyst in an amount effective for adjusting pot life of the reaction mixture to a predetermined value ranging between 10 minutes and 80 minutes at room temperature.

76. (Original) The method of claim 52, wherein the admixing step includes admixing a catalyst in an amount effective for adjusting gel time of the reaction mixture to a predetermined value ranging between 10 minutes and 70 minutes at room temperature.

77. (Original) The method of claim 52, wherein the admixing step includes admixing an organometallic catalyst present in an amount up to about 0.4 % of the reaction mixture by weight.

78. (Original) The method of claim 52, wherein the admixing step includes admixing the polyurethane resin in an amount ranging from 10% to 20% of the polymer concrete composition by weight.

79. (Original) The method of claim 52, wherein the admixing step includes admixing the polyurethane resin in an amount ranging from 10% to 15% of the polymer concrete composition by weight.

80. (Original) The method of claim 52, wherein the admixing step includes admixing the polyurethane resin in an amount that is essentially 15% of the polymer concrete composition by weight.

81. (Original) The method of claim 52, wherein the admixing step includes admixing the polyurethane resin in an amount ranging from 15% to 20% of the polymer concrete composition by weight.

82. (Original) The method of claim 52 including a step of exposing the admixture to vacuum to remove gas pockets from the admixture.

83. (Original) The method of claim 52, wherein the admixing step includes adding water to generate foam in the admixture.

84. (Withdrawn) A method of manufacturing concrete structure, the method comprising the steps of:

receiving design criteria that set forth structural specifications of concrete to be used in the concrete structure;

consulting a specifications for structural performance of soy-based polyurethane concrete based upon contents of the soy-based polyurethane concrete;

selecting a composition of soy-based polyurethane concrete that meets the design criteria; and

constructing the structure with use of the composition.

85. (Withdrawn) The method according to claim 84, wherein the design criteria are selected from the group consisting of cost, compressive strength, tensile strength, and flexural strength.

86. (Withdrawn) The method according to claim 84, wherein the design criteria are selected from the group consisting of density and abrasion resistance.

87. (Withdrawn) The method according to claim 84, wherein the specifications are selected from the group consisting of resin content, aggregate content, amount of crosslinker, and aggregate composition.

88. (Withdrawn) The method as set forth in claim 84, wherein the step of constructing comprises pouring a floor in an industrial setting.

89. (Withdrawn) The method as set forth in claim 88, wherein the step of constructing comprises pouring a floor in an agro-industrial setting.

90. (Withdrawn) The method as set forth in claim 84, wherein the step of constructing comprises constructing a transportation structure.

91. (Withdrawn) The method as set forth in claim 90, wherein the transportation structure comprises a bridge.

92. (Withdrawn) The method as set forth in claim 90, wherein the transportation structure comprises a road repair.